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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,789	04/01/2004	Hyun-soo Park	1793.1150	4971
49455	7590	07/31/2007		
STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005			EXAMINER BAYARD, EMMANUEL	
			ART UNIT 2611	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/814,789

Applicant(s)

PARK ET AL.

Examiner

Emmanuel Bayard

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-25 are rejected under 35 U.S.C. 101 because Descriptive material can be characterized as either “functional descriptive material” or “nonfunctional descriptive material.” In this context, “functional descriptive material” consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of “data structure” is “a physical or logical relationship among data elements, designed to support specific data manipulation functions.” The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) “Nonfunctional descriptive material” includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of “descriptive material” are nonstatutory when claimed as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held

statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because “[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.”). Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) (“[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.”) (quoted with approval in Abele, 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) (“form of the claim is often an exercise in drafting”). Thus, nonstatutory music is not a computer component and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory and should be rejected under 35 U.S.C. § 101. In addition, the examiner should inquire whether there should be a

rejection under 35 U.S.C. § 102 or 103. The examiner should determine whether the claimed nonfunctional descriptive material be given

patentable weight. The USPTO must consider all claim limitations when determining patentability of an invention over the prior art. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983). The USPTO may not disregard claim limitations comprised of printed matter. See Gulack, 703 F.2d at 1384, 217 USPQ at 403; see also Diehr, 450 U.S. at 191, 209 USPQ at 10. However, the examiner need not give patentable weight to printed matter absent a new and unobvious functional relationship between the printed matter and the substrate. See In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); In re Ngai, 367 F.3d 1336.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 16-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Melas U.S. Pub No 2002/0171961 A1.

As per claims 1, 18 and 23 Melas teaches an apparatus detecting binary data from an input signal read from an optical recording medium (see page 3 [0047]), the apparatus comprising: a first signal processor nonlinearly converting the input signal

(see fig.2 element 214 and pag1 paragraphs [0009-0011 and page 2, paragraph [0030] and page 3 [0034]) based on a result of comparing an absolute value of the input signal and a predetermined critical value (see page 1 paragraph [0011] and page 2 paragraph [0031]); and a second signal processor detecting binary data from the nonlinearly converted signal (see fig.2 element 210 and page 3 paragraph [0034]).

As per claims 2, 19 and 24 Melas inherently teaches wherein the first signal processor saturates the input signal by the predetermined critical value when the absolute value of the input signal is bigger than the predetermined critical value and outputs the input signal when the absolute value of the input signal is smaller than the predetermined critical value (see page 2 [0031-0032] and page 3 [0033]).

As per claims 3, 20 and 25, Melas inherently teaches wherein the first signal processor outputs a difference of the absolute value of the input signal and the critical value when the absolute value of the input signal is bigger than the critical value and outputs zero when the absolute value of the input signal is smaller than the critical value (see page 2 [0031-0032] and page 3 [0033]).

As per claim 16, Melas inherently teaches wherein the second signal processor is a viterbi decoder and the viterbi decoder uses one of three methods, that is a PR (a,b,a) method, a PR (a,b,b,a,) method, and a PR (a,b,c,b,a) method (see fig.2 element 212 and page 3 [0034]).

As per claim 17, Melas inherently teaches, wherein the viterbi decoder uses an equalizer that adjusts the frequency characteristics of the input signal (see page 2 [0029]).

As per claim 21, Melas inherently teaches wherein the converting the input signal nonlinearly is executed according to the following equation: $y = xx\{ |x| \sim k \} + k(-1)^{\text{fix}(|x| \sim k)}$ 15 Docket No.: 1793.1150 sL wherein $| |$ indicates an absolute value, the braces and their contents become one if a conditional expression contained therein is true and zero if a conditional expression contained therein is false, x is the input signal, and k is a predetermined value ranging from zero to a positive real number (see page 2 [0031-0032] and page 3 [0033]).

As per claim 22, Melas inherently teaches wherein the converting the input signal nonlinearly is executed according to the following equation: $y = xx\{ |x| \sim k \} + k(-1)^{\text{fix}(|x| > k)}$ wherein $| |$ indicates the absolute value, the braces and their contents become one if the conditional expression contained therein is true and zero if the conditional expression contained therein is false, x is the input signal, and k is the predetermined critical value ranging from zero to a positive real number (see page 2 [0031-0032] and page 3 [0033]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melas U.S. Pub No 2002/0171961 A1 in view of Raz U.S. Patent no 6,693,537.

As per claims 4-7, Melas teaches all the features of the claimed invention that yields the result of the following equation: $y = xx\{ |x| k \}$ wherein $| |$ indicates an absolute value, the braces and their contents become one if a conditional expression contained therein is true and zero if a conditional expression contained therein is false, x is the input signal, and k is a predetermined value ranging from zero to a positive real number (see page 2 [0031-0032] and page 3 [0033]) except wherein the first signal processor includes a digital filter.

Raz teaches a first processor having a digital filter (see figs.4-5 element 116 and col.2 , lines 30-55 and col.4, lines 50-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Raz into Melas as to remove the non-linear distortions created by the analog front end as well as, those created by the ADC as taught by Raz (see col.2, lines 30-35)

As per claims 8-15, Raz teaches wherein the first signal processor comprises a finite impulse response (FIR) filter in front of the digital filter, behind of the digital filter and in parallel (see figs.4-5 element 116 and col.2, lines 30-55 and col.5, lines 63-67. Furthermore implementing such teaching into Melas would have been obvious to one skilled in the art as to remove the non-linear distortions created by the analog front end as well as, those created by the ADC as taught by Raz (see col.2, lines 30-35).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okamoto U.S. Patent No 6,052,349 teaches a waveform equalizer.

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Okamoto U.S. Patent No 6,385,239 B1 teaches an adaptive equalizer circuit.

Lu U.S. Pub No 2004/0165622 A1 teaches a statistic parameterized control loop.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571 272 3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

7/25/2007

Emmanuel Bayard
Primary Examiner
Art Unit 2611

EMMANUEL BAYARD
PRIMARY EXAMINER

